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## CHAPTER TWELVE

### ADVANCING SOLUTIONS FOR CLIMATE CHANGE IN NIGERIA: AN APPRAISAL

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#### Chapter Summary

The climate change debate has moved from being an illusion to being a serious environmental challenge for modern governments especially in developing societies. Even though, countries in the Global North have been the culprit and those in the Global South have been the victims, trading blames back and forth will only aggravate the damage already done. Facing frontally the anthropogenic factors that have triggered the crisis in Nigeria, for instance, will go a long way in stemming the byzantine effects already generated. This chapter has broadened the climate change discourse by conceptualising the phenomenon, identifying its effects on the global and domestic environments and mooted solutions to arrest the menace. The chapter concludes that until the anthropogenic factors that generate and sustain the climate change menace are addressed, the present generation of Nigerians may not be adequately protected while there may be nothing to preserve for the future generations.

#### 1.1 Introduction

In the past few years and especially since the publication of the Intergovernmental Panel on Climate Change's (IPCC's) Fourth Assessment Report in 2007, attention has shifted from the question, "Is climate change real?" to the questions, "How severe will the changes be?" and "How can societies both mitigate change and build adaptive capacity?" (Ibarrarán, Malone & Brenkert, 2008:1). These shifts have been observed to bring into focus rich veins of scientific research on the vulnerabilities of specific places, the potential for climate-related disasters and disaster responses, and strategies to prepare for climate change impacts. What these research foci have in common is that they are centred within the analysis of the role of anthropogenic factors rather than the physics or chemistry in bringing about climate change. These research foci consequently open up the realm of decision-making beyond recommendations on the technical feasibility of various policy options, to a consideration of overall social development in the context of economic, political, and cultural conditions. Thus climate change and human

responsibility, the economics of addressing the problem and technical solutions, and the aspect of “climate justice” in regard to North-South (developed-developing world) relations in particular have all received substantial exposure in public debate and specialised technical, policy, and academic literature (Burnell, 2009). In fact, Burnell argues that there is a proposition about the imperative to “climate-proof” society, the poor, and even the state.

Urgent action is needed both to mitigate global warming and to protect vulnerable people against its harmful effects. Much emphasis has focused on what the Organisation for Economic Co-operation and Development (OECD) countries can do and should do to meet the challenge because these countries were responsible for the vast majority of CO<sub>2</sub> emissions in the past, their current emissions are very high, and they have the financial and technical means to address the issues both at home and abroad if they want to. However, as United Nations Secretary-General Ban Ki-moon remarked at the Delhi Sustainable Development Summit in February 2009, it is time to move on from arguing over who caused global warming and make all countries accept a common, shared responsibility for reducing the problem in the future (Burnell, 2009). Rather than trading blames, Nigeria, like other developing societies, must begin to work to address the issue of climate change and its impact on the society since factors that undermine environmental sustainability may degenerate into health problems, water and food crisis, environmental degradation, waste management crisis, and other social and environmental challenges that would and could affect the health, well-being and welfare of the citizens of the country, provoking agitation and unrest from them that could threaten even the democracy of the state (Imhonopi & Urim, 2012). This view was shared by the United Nations Framework Convention on Climate Change (UNFCCC, 2009), where it acknowledged that there exists serious adverse effects of climate change, notably those on crop production and food security, marine and coastal ecosystems, coastal livelihood, water resources and human health, ecosystems as well as on housing and infrastructure, thus having significant deleterious effects on the composition, resilience and productivity of natural and managed ecosystems, on the operation of socioeconomic systems and on human health and welfare, including crop production, fisheries and food security, water resources, as well as on housing and infrastructure.

This chapter seeks to broaden the conversation on climate change in Nigeria and advances likely solutions to stem its impact on the society.

## 2.1 Definition

According to some scholars, there are ongoing concerted efforts by stakeholders from local, national, regional, continental and global arenas to increase awareness and appreciation of the negative effects of climate change on poverty reduction, growth and sustainable development efforts (Anyadike, 2009; Eboh, 2009; Ozor, 2009a & 2009b; Ward, 2010). In fact, there is now a strong global consensus that climate change presents an urgent challenge to human welfare and sustainable development. Climate change has been conceptualised by the Intergovernmental Panel on Climate Change (IPCC) as statistically significant variations that persist for an extended period, typically decades or longer and includes shifts in the frequency and magnitude of sporadic weather events as well as the slow continuous rise in global mean surface temperature (IPCC, 2001 & 2007). According to Anyadike (2009), there is no such thing as a “normal” or average climate but as the weather changes from day to day, so also climate changes from year to year. He however notes that these changes are however cyclical or largely unnoticed, except by climatologists. He concurs with the IPCC’s submission that climate change is that change in climate that continues in one direction at a rapid rate and for an unusually long period of time, lasting for several years. He believes that what is being experienced recently, globally, is a footprint of a change in climate typified by steady and general increase in temperature. According to Eboh (2009), climate change manifests in a number of ways including changes in average climatic conditions; some regions may become drier or wetter on average; changes in climate variability such as rainfall events may become more erratic in some regions; changes in the frequency and magnitude of extreme weather events and changes in sea levels are also evident. The rate and duration of warming observed during the 20th century are unprecedented. Increases in maximum temperature, numbers of hot days and the heat index have been recorded globally during the second half of the 20th century (Imhonopi & Urim, 2011).

According to Anyadike (2009), there are three major causes of climate change: (i) astronomical causes, (ii) volcanic eruptions and (iii) anthropogenic (human-related) causes. This chapter is concerned with the anthropogenic dimension of climate change. In this wise, the single human activity that is most likely to have a large impact on the climate is the burning of “fossil fuels” such as coal, oil and gas, including gas flaring. These fuels contain carbon, and burning them makes carbon dioxide gas. Gas flaring, for instance, threatens global health by emitting significant volumes of greenhouse gases which contribute to climate change and threatens local health by emitting toxins that poison local villagers, their lands and rains, flora and fauna.

Furthermore, energy generation in Nigeria is by thermal means, i.e. burning of fossil fuels such as gas, petrol, kerosene and diesel. As Imhonopi & Urim (2011) observe, the present Nigerian micro and macro economy depends on generators for the supply of electricity, thus increasing the country's carbon footprint and further tipping the country towards an ecological crisis. The situation is further exacerbated by the lack of technological development in the country which has left it with fewer options regarding the adoption of renewable energy technologies to meet its energy needs. An estimated 60-70% of the Nigerian population does not have access to electricity, while energy demand in Nigeria is dominated by firewood and coal and women and children are the most affected in the energy crisis (Uyigue, Agho and Edevbaro, 2007). Consequently, energy production processes in Nigeria which are dominated by the burning of fossil fuel and the use of firewood, resulting in deforestation and de-vegetation, increases Nigeria's ecological vulnerability and exposes the citizens to the negative impact of climate change unless the trend is reversed. The continued act of deforestation and de-vegetation of the country through crude energy production practices, bush burning, urbanisation and industrialisation remains an important potential factor in climate change in Nigeria. As Eboh (2009) vehemently argues, even if efforts to reduce greenhouse gas (GHG) emissions are successful, it is no longer possible to avoid some degree of global warming and climate change. Greenhouse gases (GHG) are made up of a build-up of carbon monoxide (CO), methane (CH<sub>4</sub>), sulphur (IV) oxide (SO<sub>2</sub>) and others and are termed greenhouse gases because of their abilities to absorb terrestrial radiation from the earth and re-radiate the heat back to earth, thereby leading to a general increase in temperature known as global warming. As Imhonopi & Urim (2011) noted, the primary direct effects of climate change are an increase of droughts and floods, more seasonal peaks in river flow, and a higher probability of stronger tropical storms. Nigeria, like other countries in sub-Saharan Africa, is likely to suffer the most because of its geographical location, low incomes, and low institutional capacity, as well as its greater reliance on climate-sensitive renewable natural resources sectors like agriculture. The impacts of climate change on agriculture are projected to manifest through changes in land and water regimes, specifically, changes in the frequency and intensity of droughts, flooding, water shortages, worsening soil conditions, desertification, disease and pest outbreaks on crops and livestock. Adaptation to climate risks and change therefore is increasingly important in Nigeria.

#### **4.1 Theoretical Perspectives of Global Climate Change**

This study has adopted the Human Ecology and Environmental Impact Perspectives in analysing the subject matter. According to Imhonopi & Urim (2011), sociologists have applied

theories from ecology to study the complex relationship between humans and their natural environment. The human ecology perspective underscores the socio-spatial dynamics of climate change and varied interactions humans have with their physical environments across spatial and temporal scales. According to Betsill (2000), sociologists have applied this “place-based approach” to research on migration, resource competition, and disaster relief. This perspective provides evidence that while climate change is a global threat, its effects are experienced locally, and can better be understood when sociologists include data from humans’ biophysical environments. A major contribution by environmental sociology is modelling the social causes and consequences of environmental change. These modelling techniques are directly applicable to the study of global climate change. Environmental impact researchers have documented many of the pathways and obstacles to transitioning to a low carbon economy on both micro and macro levels. Areas for future research include assessments of carbon trading schemes and the impact of economic development on environmental change in the twenty-first century global system (Zahran, Brody, Vedlitz, Grover and Miller, 2008). Through these perspectives, it is argued in this chapter that climate change stems from anthropogenic causes and that the relationship between humans and their natural environment and environmental assessments indicate the causes, impacts and cures of climate change in the modern society.

## **5.1 Impact of Climate Change in the Global Environment**

It has been argued that while countries in the Global North are the culprits of climate change and environmental pollution through their vast swathes of industrial activities, countries in the Global South are the victims of these environmental or climate violations (Burnell, 2009; Imhonopi & Urim, 2011). According to Bullard (2008), the world’s poorest countries of the Global South and most vulnerable peoples will suffer the earliest and most damaging setbacks as a result of climate change, even though they have contributed least to the problem of global warming. However, he also identified the impact of climate change globally. According to him, scientists predict droughts, wildfires, and dust transported between continents to cause locally severe economic damage and substantial social and cultural disruption and possible political conflict—including North-South conflict. He specifically mentioned that the number of people forced to flee their homes because of extreme weather events is increasing globally. Over 2 billion people worldwide were affected by disasters in the last decade. In 2001, more than 170 million people were affected by disasters, 97 percent of which were climate-related. Bullard

(2008) states that there are more “environmental refugees” (25 million) than “political refugees” (22 million) and opined that by 2010, the number of environmental refugees is expected to grow to 50 million and could reach as high as 150 million by 2050. Most of these refugees are uprooted by gradual environmental shifts such as desertification, diminishing water supplies, and rising sea levels. Also the costs of climate change have been on the rise since the 1990s due to disasters such as hurricanes, floods, and fires which caused over \$608 billion in economic losses worldwide (Imhonopi & Urim, 2011). There has also been a decline in food production, making drought-prone regions especially vulnerable to food shortages and “food riots.” Point to the adverse effect of climate on health globally, some writers have identified increased injuries and deaths from severe weather such as hurricanes, heat stress, cold stress (hypothermia), as well as increasing death rates and cardiovascular and respiratory disease related to aeroallergens and worsening air pollution caused by the higher concentration of ground-level ozone (smog) that accompanies higher temperatures (Nagel, Dietz & Broadbent, 2008). These authors contend that ground level ozone sends an estimated 53,000 persons to the hospital, 159,000 to the emergency room and triggers 6,200,000 asthma attacks each summer in the eastern half of the United States, while air pollution causes an estimated 50,000 to 120,000 premature deaths in the U.S. each year alone. However, approximately 600,000 deaths have occurred worldwide as a result of weather-related natural disasters in the last decade and some 95 percent of these have been in poor countries (Imhonopi & Urim, 2011).

## **5.2 Climate Change in Nigeria**

Aside the numerous challenges facing the Nigerian state, climate change has arisen as a silent challenge the country and is believed to be behind certain agitations such as resource control, correction of environmental pollution and degradation of many Nigerian towns and villages and the Niger Delta uprising, among others. Nigeria, over the past few years, has been beset by a lot of climate anomalies. Consequences of extreme climate events due to global warming have been so dramatic that there has been considerable and disturbing concern among various levels of government and citizens in the country. These consequences include flooding, desertification, erosion, drought, sea level rise, heat or cold stress, pests and diseases, erratic rainfall patterns, and land degradation (Ozor, 2009a). As Imhonopi & Urim (2011) noted, the South-south geopolitical zone is mainly affected by sea level rise and deforestation-induced changes; the Southwest zone by sea level rise and deforestation-induced changes; the Southeast

by erosion, flooding, and land degradation; the North-central by changes due to de-vegetation and overgrazing; the Northeast by drought, desertification and heat stress; and the Northwest by drought, desertification and heat stress.

These changes are having devastating impacts on many vulnerable communities in Nigeria such as farmers, pastoralists, foresters, fisher folks and hunters who are becoming environmental refugees in the country. Additionally, the continued urbanisation and industrialisation of the country, requiring the indiscriminate felling of trees, bush burning and massive rural-urban drift, according to the human ecology and environmental impact perspectives, have put pressure on the environment, increasing the carbon economy and the release of greenhouse gases which have contributed to the negative effects of global warming in the country. Thus, lack of or slow response of the government to address the impact of climate change in Nigeria has culminated in the loss of farm lands, viable occupations and employment for the people, lack of grazing land due to desertification, continuous death of livestock, poor standard of living and environmental/land degradation which may explain the rise of the Niger Delta militants, the Boko Haram sect, and other ethnic agitations within the country. Other impacts of climate change in Nigeria include:

### **Resource Crisis and Conflicts**

Climate change leads to the continuing explosion in global demand for essential resources such as food, water and oil. This is coming just as the planet's ability to deliver many of these materials is weakening. Moss (2009) points to this scenario in harness with the climate crisis as a having the potential to pose a challenge to the security of an order not previously faced in modern times. Pieces of evidence abound in Nigeria where there is intermittent struggle over graze land and water bodies between the Fulani cattle rearers and many farming communities, for example, the Mutumbiu and Mambila highlands in Taraba State, and the Fufore community in Adamawa State, among others (Ozor, 2009). These crises have always led to several deaths of farmers and pastoralists within and outside the region. Streams and rivers have also dried up in some communities due to climate change, forcing affected communities to go in search of water in neighbouring communities with its attendant man hour losses, and propensity to trigger conflicts and hardships on the people. The situation could worsen for more millions of people as climate change alters the variability and quantity of available water. At the same time, the demand for water is increasing due to the country's growing population and its

mounting aspirations. This situation triggers distributional conflicts and poses major challenges to water management systems in Nigeria.

### **Increasing Unemployment**

As Imhonopi & Urim (2011) observed, with the diminishing resources, drying up of streams, lakes and rivers, the pollution and environmental degradation of arable farmlands, many agricultural and fishing communities will disappear, with the potential of ballooning the unemployment market as many Nigerians at the grassroots lose their jobs. These individuals and families may now be forced to depend on government grants, child support grants, and others, for their survival, due to the decline in the fishing and farming industries. When government support fails to come through or is not adequate, the situation can predispose victims to hunger, sicknesses, resource over-exploitation and other social vices such as conflicts and militancy and these may further threaten Nigeria's political stability if the situation is not arrested.

### **Pauperisation of Many Nigerians**

Climate change has been predicted to deepen poverty both directly and indirectly in developing countries (World Bank, 2002). According to the report, the direct impacts include: the loss of life, livelihoods, assets, infrastructure, and others from climate extreme events. According to a report on the poverty impacts of climate change, it affirmed that the poorest (countries and people) are most at risk and identified a range of poverty-related climate change impacts to include: reduction in crop yield, food insecurity, unemployment, income and economic stagnation, huge displacement of people from coastal and densely populated areas, exposure of millions of people to new health risks, especially from vector-based diseases like malaria and schistosomiasis, as well as water-borne diseases like cholera and dysentery, malnutrition, and susceptibility to desertification, declining soil fertility, and dependency on subsistence agriculture (Nagel, Dietz, & Broadbent, 2008).

### **Health Crisis**

Climate change is known to trigger health challenges within locales. According to Imhonopi & Urim (2011), there are reported incidences of an explosion of climate-related health crisis in many Nigerian communities today. They observed that the aspects of health that will be exacerbated by climate change include: increased cases of cataracts (eye disease) in the northern parts of Nigeria due to low cloud cover and greater intensity of solar radiation;



increased cases of malaria and typhoid due to increased rainfall and temperature in certain parts of the country; and increased cases of water-borne diseases such as cholera and dysentery due to urban flooding, and improper disposal of wastes. As a report had it, oil companies in Nigeria engage in gas flaring, as a 24 hour-a-day, 365 day-a-year practice, burning the associated gas that comes out of the ground when oil is extracted (JINN, 2010). Some of these flares have burned without cessation for 40 years. People live literally next door to the roaring, ground-level flares that leap as high as a several-story building and belch black clouds of toxic smoke in the middle of, or next door to, their villages. Gas flaring harms local health through emissions that have been linked to cancers, asthma, chronic bronchitis, blood disorders, and other diseases.

### **6.1 Solutions for Climate Change in Nigeria**

In Nigeria, available records show that the greatest concentrations of CO<sub>2</sub> which mainly cause global warming are due to the burning of fossil fuels, gas flaring and deforestation (Imhonopi & Urim, 2011). This shows that anthropogenic activities are mainly responsible for climate change. It also means then that measures to mitigate the effects/impacts of climate change will involve mainly legislative and technological approaches. Unfortunately, Nigeria lacks the technological capabilities to deal with this issue. Even when the bills are passed into law there are often implementation problems due to unnecessary bureaucracy and other challenges facing the Nigerian state.

In Nigeria, mitigation measures of the effect of climate change could include the following. First, there is need for citizen education on the reduction of activities and actions that promote increased carbon emissions and that contribute to environmental unsustainability. Second, citizen participation is critical to efforts targeted at mitigating anthropogenic factors that trigger and sustain the present climate crisis in place. Concomitantly, the involvement of citizens should be carried out at all levels including village, community, local, state and federal government levels such that their contributions would aggregate to reduce practices and activities that are not healthy for the environment. Three, the political leadership in the country should enlist international democracy support of developed economies who have successfully evolved effective climate change solutions for their countries. Such support could help in

rapidly addressing the impact of the crisis in the area of health, waste and water management, food shortages and environmental degradation. Four, government must have the political will to earmark some of the state resources to fight environmental crises in the country. Five, there is need for the green audit of government operations. Since government is the largest employer of labour and expends huge resources in its annual operations, adopting clean and green technologies and practices will not only reduce the expenditure of government, but it will also promote environmental sustainability, reduce climate-related health hazards, improve the ecosystem and make for sustainable resource renewal. Six, the political leadership needs to lead by example in the promotion and advocacy of green and clean technologies and actions that protect and replenish the environment such as a paperless economy, waste management and recycling, afforestation and electronic governance. Seven, there is need to re-build and re-introduce effective rail transportation system in order to reduce the present massive dependence on long distance vehicles such as lorries, trucks and buses, which consume and release gases injurious to the environment. Eight, the government must follow through its reforms in the power sector so that with constant power supply, dependence on generating sets and firewood burning will be reduced drastically, if not eliminated. Government should also begin to invest in renewable energy technologies like solar, wind, and hydro energy sources. Nine, government should find a solution to the present illegal practices of gas flaring in oil fields in the Niger Delta. By gas re-injection and provision of very strict penalties to erring oil exploring firms, this practice can be stopped. Lastly, government must be serious about the establishment of a nation-wide programme of reforestation, tree planting, erection of wind breaks to create shelter belts in the northern areas to spur environmental stability, soil fertility, greater food production, reduction of environmentally-induced migration and consequently stability in the political arena.

## **7.1 Conclusion**

Climate change is no more an illusion called up by the roguish imagination of the political class or civil society gladiators. Climate change is here in Nigeria as the recent rise in flooding, environmental degradation and pollution and climate change health-induced crises all attest to the need to tackle this insidious enemy frontally. Climate change, which is attributed to the emission of gases known as greenhouse gases mainly: CO<sub>2</sub>, CO, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub> into the atmosphere, traps terrestrial radiations from the earth and re-radiates the heat back to earth, thereby leading to a general increase in temperature known as global warming. The chapter has identified effects of climate change in Nigeria to include flooding, drought, erosion,

desertification, sea level rise, heat and cold stress, pests and diseases, erratic rainfall pattern and others. These effects will undoubtedly affect the Nigerian society if not reversed and could even lead to armed conflicts, popular uprising and social insecurity. The impacts of climate change in Nigeria such as low agricultural productivity, food insecurity, resource conflicts, poverty, unemployment, environmentally-induced migration, health issues and livelihood problems are present challenges that need to be addressed to protect the present generation of Nigerians and preserve the commonwealth for future generations.

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